



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/054,228

11/13/2001

Stuart Leon Soled

NLF-0101

3753

27810

7590

01/06/2004

EXXONMOBIL RESEARCH AND ENGINEERING COMPANY
P.O. BOX 900
1545 ROUTE 22 EAST
ANNANDALE, NJ 08801-0900

EXAMINER

STRICKLAND, JONAS N

ART UNIT

PAPER NUMBER

1754

DATE MAILED: 01/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/054,228

Applicant(s)

SOLED ET AL.

Examiner

Jonas N. Strickland

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,9-13,18-21 and 26-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,9-13,18-21 and 26-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This Detailed Action is in response to the amendment filed on 11/17/2003. Claims 1-4, 9, 11, 18-21 and 26 have been amended. Claims 5-8 and 14-17 have been cancelled. Furthermore, Applicant has added new claims 27 and 28.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 27 and 28 have been renumbered to claims 29 and 30. Applicant submitted claims 27 and 28 on 10/15/2002.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Pedrick et al. (US Patent 5,268,344).

Applicant claims a process for activating a regenerated, but not reactivated catalyst comprising: introducing said catalyst into a slurry HCS reactor operating at HCS

Art Unit: 1754

slurry conditions and containing catalyst rejuvenation means, whereby said catalyst is activated.

Pedrick et al. discloses a draft tube for catalyst rejuvenation and distribution.

Pedrick et al. continues to disclose wherein a catalyst in a slurry phase reactor is rejuvenated and uniformly distributed in said reactor (see abstract). The HCS reactor is operated at a temperature between 175° C to 300°C and a pressure between 1 to 100 atmospheres (col. 7, lines 49-55). Pedrick et al. continues to teach wherein the rejuvenation temperature is within the temperature range of the HCS reactor, from 400° to 500° F (col. 5, lines 41-43). Therefore, the catalyst is rejuvenated within the slurry reactor as instantly claimed.

The catalyst is comprised of cobalt, having ruthenium and rhenium promoters on a titania support (col. 8, lines 15-44). ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pedrick et al. (US Patent 5,268,344) in view of Bauman et al. (US Patent 5,844,005).

Applicant claims with respect to claim 4, wherein the HCS reactor operates in an hourly gas space velocity for syngas in the range of 100-40,000 V/hr/V.

The teachings of Pedrick et al. have been discussed with respect to claims 1-3 and 9, but Pedrick et al. does not teach wherein the HCS reactor operates in an hourly gas space velocity for syngas in the range of 100-40,000 V/hr/V.

However, Bauman et al. teaches a hydrocarbon synthesis process for catalyst rejuvenation, wherein the space velocity is 100-40,000 V/hr/v (col. 4, lines 15-18).

Therefore, it would have been obvious to one of ordinary skill in the art to carry out the HCS process disclosed by Pedrick et al. with the space velocity as taught by Bauman et al., since Bauman et al. teaches wherein it is known in the art for a hydrocarbon synthesis process for catalyst rejuvenation, to have a space velocity in the range of 100-40,000 V/hr/v. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art would have expected a HCS process, which rejuvenates a catalyst as taught by Bauman et al. to have been similarly useful and applicable to a process for rejuvenating a hydrocarbons synthesis catalyst as taught by Pedrick et al.

8. Claims 10-13 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pedrick et al. (US Patent 5,268,344) in view of Hsia (US Patent 5,260,239).

Applicant claims a process for activating a regenerated, but not reactivated catalyst comprising: introducing said catalyst into a slurry HCS reactor operating at HCS slurry conditions and containing catalyst rejuvenation means, whereby said catalyst is activated, wherein removing a portion of the catalyst from the HCS reactor to a

regeneration vessel and subjecting the removed catalyst to a regeneration environment to form said regenerated catalyst.

The teachings of Pedrick et al. have been discussed with respect to claims 1-3 and 9. However, Pedrick et al. fails to disclose certain limitations of claims 10-13 and 18-20.

Hsia discloses an external catalyst rejuvenation system for the hydrocarbon synthesis process. Hsia clearly discloses wherein for ease of operation the rejuvenation technique can be affected at hydrocarbon synthesis conditions at whatever they may be, but preferably temperatures and pressures optimized for catalyst reactivation regeneration may be used. The regeneration rejuvenation is conducted at a temperature in the range 250-500°F and having a pressure ranging from 75 to 450 PSIA (col. 6, lines 23-33). The catalyst may be comprised of catalytic metals, such as iron, cobalt, and ruthenium (col. 7, lines 31-37). Hsia continues to disclose wherein a second metal component, such as rhenium may also be added to the catalyst (col. 7, lines 46-60). With respect to claim 10, see Figure 1. With respect to claim 11, Hsia discloses wherein the rejuvenation process is conducted on a continuous basis (col. 3, lines 65-68). With respect to claim 12, Hsia teaches wherein regeneration occurs in an oxygen environment (col. 2, lines 22-26). Since Hsia teaches wherein the regeneration occurs at hydrocarbon synthesis conditions and wherein the HCS conditions may range from 175-450°C (col. 6, lines 5-9). Therefore it would be expected for the regenerative oxidative environment to be greater than 300°C. Hsia also teaches a hydrogen treatment (col. 6, lines 34-39).

It would have been obvious to one of ordinary skill in the art to modify the teachings of Pedrick et al., based on the teachings of Hsia, by moving a portion of the catalyst from the HCS reactor to a regeneration vessel and then subjecting the catalyst to a regeneration environment to form a regenerated catalyst, because Hsia teaches moving a portion of a cobalt catalyst from a HCS reactor and then moving the catalyst to a regeneration environment to form a regenerated catalyst. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art, would have expected a process for treating a HCS catalyst in a HCS reaction process as taught by Hsia et al., to be similarly useful and applicable to a process for treating a catalyst in a HCS reaction process as taught by Pedrick et al.

9. Claims 21 and 26-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pedrick et al. (US Patent 5,268,344) in view of Hsia (US Patent 5,260,239) and Bauman et al. (US Patent 5,844,005).

Pedrick et al. discloses a draft tube for catalyst rejuvenation and distribution. Pedrick et al. continues to disclose wherein a catalyst in a slurry phase reactor is rejuvenated and uniformly distributed in said reactor (see abstract). The HCS reactor is operated at a temperature between 175° C to 300°C and a pressure between 1 to 100 atmospheres (col. 7, lines 49-55). Pedrick et al. continues to teach wherein the rejuvenation temperature is within the temperature range of the HCS reactor, from 400° to 500° F (col. 5, lines 41-43). Therefore, the catalyst is rejuvenated within the slurry reactor as instantly claimed. However, Pedrick et al. does not disclose the hourly gas space velocity and returning the regenerated catalyst to the HCS reactor.

Bauman et al. teaches a hydrocarbon synthesis process for catalyst rejuvenation, wherein the space velocity is 100-40,000 V/hr/v (col. 4, lines 15-18).

Hsia discloses an external catalyst rejuvenation system for the hydrocarbon synthesis process. Hsia clearly discloses wherein for ease of operation the rejuvenation technique can be affected at hydrocarbon synthesis conditions at whatever they may be, but preferably temperatures and pressures optimized for catalyst reactivation regeneration may be used. The regeneration rejuvenation is conducted at a temperature in the range 250-500°F and having a pressure ranging from 75 to 450 PSIA (col. 6, lines 23-33). The catalyst may be comprised of catalytic metals, such as iron, cobalt, and ruthenium (col. 7, lines 31-37). Hsia continues to disclose wherein a second metal component, such as rhenium may also be added to the catalyst (col. 7, lines 46-60). With respect to claim 10, see Figure 1. With respect to claim 11, Hsia discloses wherein the rejuvenation process is conducted on a continuous basis (col. 3, lines 65-68).

It would have been obvious to one of ordinary skill in the art to modify the teachings of Pedrick et al., based on the teachings of Hsia and Bauman, by moving a portion of the catalyst from the HCS reactor to a regeneration vessel and then subjecting the catalyst to a regeneration environment to form a regenerated catalyst, because Hsia teaches moving a portion of a cobalt catalyst from a HCS reactor and then moving the catalyst to a regeneration environment to form a regenerated catalyst, as well as maintain the space velocity as taught by Bauman et al., since Bauman et al. teaches wherein it is known in the art for a hydrocarbon synthesis process for catalyst

rejuvenation, to have a space velocity in the range of 100-40,000 V/hr/v. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art, would have expected a process for treating a HCS catalyst in a HCS reaction process as taught by Hsia et al. and Bauman, to be similarly useful and applicable to a process for treating a catalyst in a HCS reaction process as taught by Pedrick et al.

Response to Arguments

10. Applicant's arguments with respect to claims 1-4, 9-13, 18-21, and 26-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion


11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonas N. Strickland whose telephone number is 703-306-5692. The examiner can normally be reached on M-TH, 7:30-5:00, off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 703-308-3837. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0661.


Jonas N. Strickland
December 24, 2003


STANLEY S. SILVERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700